

**How Has Asia Fared in the Global Crisis?**  
**A Tale of Three Countries: Republic of Korea, Philippines, and Thailand**

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**Abstract:** The global economic crisis in 2008–2009 had varying impacts on economies in Asia and the Pacific. This paper studies the impacts of the global crisis, with emphasis on the labour market, on three Asian countries: Republic of Korea (Korea), Philippines, and Thailand. It develops a *crisis index* that measures the impacts of the crisis by comparing actual values of economic indicators during the crisis period (2008–2009) with counterfactual indicators derived from each country's pre-crisis (2001–2007) long-term trends. The study finds that all three countries were significantly affected by the crisis, but the severity and channels of these impacts varied widely: Thailand suffered the most in terms of reduced growth in gross domestic product, Korea suffered the worst in reduced employment, and Philippines' output was affected only in 2009. In the labour market, the study finds that the crisis led to significant job losses in all three countries and highlighted underlying problems, particularly Korea's problems with youth unemployment, and Philippines' and Thailand's vulnerable industrial sectors.

**Keywords:** Financial crisis, Economic Indicator, Growth, Employment Creation,  
Employment Data, Unemployment, Labour Policy

**JEL Classification:** E1, E2, J2, J6

## **I. INTRODUCTION**

The global financial crisis did not begin in Asia and the Pacific; nevertheless, many economies in the region found themselves adversely affected by the crisis. In 2008, the region saw stock markets plummet and currencies tumble in Asia. Indeed, economic growth in most Asian countries has slowed down in 2008, particularly during the last quarter. There is also concern that the region's labour markets have been adversely affected by the financial crisis (ILO, 2009), pointing out that the impact of the crisis may be felt through falling demand for labour, downward pressure on wages, falling remittances, and rising informal employment, among others.

As the global crisis originated in the United States (US) financial markets, job losses in economies with well-developed and highly integrated financial service industries, such as Hong Kong, China; Japan; Republic of Korea (Korea); and Singapore, occurred immediately, especially among white-collar workers. However, in developing countries in Asia, the labour market was more deeply affected when the exports declined due to the crisis. As overseas consumer demand fell, labour-intensive export industries such as textiles, garments, and electronics faced increasing pressures to lay off workers, while the local construction industry likewise contracted due to decreased domestic consumer confidence. Moreover, already gloomy employment prospects were exacerbated due to the slowdown of foreign direct investment (FDI) in the region, which put a brake on creating new enterprises and jobs.

When formal sector employment starts shrinking due to an economic downturn, a majority of laid off workers—particularly in developing countries—take up some form of employment to offset lost income and therefore will not be counted as unemployed in labour market statistics. Instead, they are highly likely to move to the informal service sector where pay is often lower and job quality is inferior, or to migrate to rural areas to work in agriculture. While there are many speculations on the possible impacts of the crisis on labour markets, few studies provide quantitative analyses on the issue. This study aims to fill the gap.

This study attempts to capture the impact of the crisis on economic output measured by gross domestic product (GDP) and per capita GDP—both of which are adjusted for price changes—and key labour market indicators including employment, unemployment, and labour force participation. Moreover, the labour market impact is assessed by different socioeconomic and demographic groups. The impact of the crisis is captured using a crisis index that is introduced for the current study.

At the outset, it should be pointed out that focusing on the periods just before and after the crisis cannot isolate its impact. A more appropriate approach to capture the crisis impact would be to answer a counterfactual question—if the crisis had not happened, what would have been the values of economic variables?—and then to compare the counterfactual values with the actual values obtained from the crisis period. Constructing a model to capture counterfactuals is not an easy task. This paper follows a pragmatic approach that looks at the long-term trends and then tries to understand if any structural change occurred in the crisis period. The magnitude of this structural change can in fact provide the impact of the crisis. The crisis index proposed in this paper provides a quantitative measure of such a structural change in the long-term trend. The paper also develops statistical tests to infer whether the crisis had a significant impact on particular economic variables selected for the current study.

This study utilizes 34 quarterly values of economic indicators from the first quarter of 2001 to the second quarter of 2009. To measure the long-term trends, the series of indicators needs to be adjusted for seasonal effects. The trend model proposed in this study accounts for seasonality using seasonal dummies. In particular, adjusting for seasonality is important for labour market statistics as these indicators are sensitive to seasonal changes.

The crisis' impacts on economic growth and labour markets are expected to differ from one country to another. As explained in the *Asian Development Outlook 2009 Update*, the more open economies in Asia and the Pacific—such as Hong Kong, China; Korea; Singapore; and Thailand—are expected to be hit hardest by the crisis. On the other hand, the economies with less-developed financial markets and not highly integrated with financial markets in the US and Europe—such as the Philippines—are likely to avoid the strong adverse impacts of the crisis that

the open economies experienced in the second half of 2008 until the first half of 2009. In this context, it is interesting to carry out a comparative study of some of the countries mentioned above. This study presents a comparative study of Korea, Thailand, and Philippines, which suffered less from the crisis compared with the first two countries.

The rest of the paper is structured as follows. Section II explains the methodologies introduced for the study. The proposed methodologies are applied to Section III, which presents a comparative study of the three countries. Section IV summarizes the major findings of the study.

## **II. METHODOLOGY**

### **A. Basic Regression Model**

To capture the impact of the crisis, it is critical to ask when the crisis precisely began. It would be incorrect to state that the economic crisis started about the fourth quarter of 2007, as the financial crisis only began to impact the real economy about the first quarter of 2008. From this, it is reasonable to assume that the economic crisis began in the first quarter of 2008 and continued well into the second quarter of 2009. Asian economies enjoyed fairly robust growth from the first quarter of 2001 to the fourth quarter 2007, so this will be used as the pre-crisis period in the study. The study's basic model is estimated using quarterly data for the pre-crisis period.

The trend regression model is given by

$$\log(x_t) = \alpha_0 + \alpha_1 D_{1t} + \alpha_2 D_{2t} + \alpha_3 D_{3t} + \alpha_4 D_{4t} + \beta t + u_t \quad (1)$$

where  $x_t$  is the value of an economic variable in period  $t$  (e.g., employment level);  $D_{it}$  is a dummy variable that takes the value of 1 if a variable in period  $t$  falls in the  $i$ th quarter and otherwise 0, where  $i$  varies from 1 to 4; and  $u_t$  is the error term that follows a random distribution with zero mean and constant variance.

Note that the sum of four dummy variables—i.e.,  $\sum_{i=1}^4 D_{it}$ —is always equal to 1 for all  $t$ . This suggests that model (1) cannot be estimated by the least squares method because of perfect multicollinearity. However, it can be estimated by dropping one dummy variable—which can be regarded as a reference quarter—and this will enable measurement of the seasonal effect of any quarter relative to the reference quarter. Without loss of generality, it can be assumed that the first quarter is the reference period. Applying this assumption, the following model can then be estimated:

$$\log(x_t) = \alpha'_0 + \alpha'_2 D_{2t} + \alpha'_3 D_{3t} + \alpha'_4 D_{4t} + \beta t + u_t \quad (2)$$

Substituting  $D_{1t} = 1 - D_{2t} - D_{3t} - D_{4t}$  in (1) gives

$$\log(x_t) = \alpha_0 + \alpha_1 + (\alpha_2 - \alpha_1) D_{2t} + (\alpha_3 - \alpha_1) D_{3t} + (\alpha_4 - \alpha_1) D_{4t} + \beta t + u_t \quad (3)$$

Comparing (2) and (3) gives the following relationships:

$$\alpha'_0 = \alpha_0 + \alpha_1 \quad (4)$$

$$\alpha'_2 = \alpha_2 - \alpha_1 \quad (5)$$

$$\alpha'_3 = \alpha_3 - \alpha_1 \quad (6)$$

$$\alpha'_4 = \alpha_4 - \alpha_1 \quad (7)$$

Since there are five unknown parameters in (1) and four equations from (4) to (7), equation (1) cannot be estimated. As such, one additional equation is needed to estimate model (1) that could be obtained from the following:

$$\alpha_1 + \alpha_2 + \alpha_3 + \alpha_4 = 0 \quad (8)$$

which is simply the normalization of seasonal effects. These five equations (4) to (8) allows one to identify all five parameters in (1); i.e.,  $\alpha_0, \alpha_1, \alpha_2, \alpha_3, \alpha_4$ .

## B. Seasonal Indexes

Equation (1) can be used to obtain the seasonally adjusted series for an economic variable  $x_t$  as

$$x_t^s = x_t e^{-\alpha_1 D_{1t} - \alpha_2 D_{2t} - \alpha_3 D_{3t} - \alpha_4 D_{4t}} \quad (9)$$

which can smooth out the seasonal variations. The value of  $\alpha_i$  measures the impact of the  $i$ th season. Like before, it is assumed that the first quarter is the reference period. Following from that, the seasonal index for the  $i$ th quarter is defined as

$$s_i = 100 \left[ e^{(\alpha_i - \alpha_1)} - 1 \right] \quad (10)$$

where  $i$  takes a value of 2, 3 or 4.

If  $x_t$  measures the employment level, then  $s_i$  is interpreted as the percentage of additional employment that is generated in the  $i$ th quarter in comparison with the reference quarter. The value of  $s_i$  can be negative or positive. Using equations (5), (6), and (7), equation (10) can be expressed as

$$s_i = 100 \left[ e^{\alpha_i} - 1 \right] \quad (11)$$

A consistent estimator of  $s_i$  is thus obtained by

$$\hat{s}_i = 100 \left[ e^{\hat{\alpha}_i} - 1 \right] \quad (12)$$

where  $\hat{\alpha}_i$  is the least squares estimator of  $\alpha_i$  which can be estimated from applying the least square method to the regression equation (2).<sup>1</sup>

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<sup>1</sup> Note that the least square estimators of parameters in (2) are always consistent under the assumptions of the model used here.

For practical purposes, it is useful to know whether the magnitude of the seasonal index is zero or significantly different from zero. If it is found to be significantly different from zero, then it can be said that the seasonal impact is important and cannot be ignored. To answer this question, the standard error of the seasonal index should be calculated. After deriving the standard error, the  $t$ -value can be easily computed to make a statistical inference on the index.

Derived from (12), the standard error of  $\hat{s}_i$  can be obtained by

$$se(\hat{s}_i) = 100e^{\hat{\alpha}_i} se(\hat{\alpha}_i) \quad (13)$$

where  $se(\hat{\alpha}_i)$  is the standard error of  $\hat{\alpha}_i$  obtained from the regression model (2). The  $t$ -value of  $\hat{s}_i$  can be written as

$$t(\hat{s}_i) = \frac{(e^{\hat{\alpha}_i} - 1)}{e^{\hat{\alpha}_i} se(\hat{\alpha}_i)} \quad (14)$$

which allows one to test a statistical significance of the seasonal effects.

### C. Trend Growth Rates

To measure a long-term trend, the growth rate in  $x_t$  needs to be computed after controlling for the seasonal effects. Equation (2) controls for seasonal effects, which leads to an estimate of quarterly growth rate  $r$  as

$$r = 100(e^{\hat{\beta}} - 1) \quad (15)$$

where  $\hat{\beta}$  is the least square estimator of  $\beta$ , estimated from (2). As  $r$  is the quarterly growth rate, the annual growth rate is thus obtained by multiplying  $r$  by 4.

To infer if the trend growth rate is statistically significant, the  $t$ -value for the estimated growth rate needs to be calculated. If  $se(\hat{\beta})$  is defined as the standard error of  $\hat{\beta}$ , then the  $t$ -value for  $r$  will be given as

$$t(r) = \frac{(e^{\hat{\beta}} - 1)}{e^{\hat{\beta}} se(\hat{\beta})} \quad (16)$$

#### D. The Crisis Index

The basic model described in (1) is fitted using quarterly data covering the pre-crisis period from the first quarter of 2001 to the fourth quarter of 2007. Using the fitted model, the forecast or expected values for every quarter of the crisis period from the first quarter of 2008 are accordingly estimated. Suppose  $x^*$  and  $\hat{x}^*$  are the actual and expected values of  $x_t$  in a quarter during the crisis period, respectively. The crisis index for that quarter is defined as

$$C = 100 \left( \frac{x^*}{\hat{x}^*} - 1 \right) \quad (17)$$

If the crisis index is computed for unemployment, then  $C$  is interpreted as the percentage of additional unemployment that resulted from the economic crisis. In other words, if the economic crisis had not occurred, the level of unemployment would have been less by  $C$  percent during the crisis period given past trends and seasonal effects. An index  $C$  that is zero or near zero suggests the absence of any structural change in the crisis period and, thus, insignificant impacts for the crisis.

To test whether the crisis index is significantly different from zero, the standard error of the crisis index needs to be derived. To derive the standard error, we begin by defining

$$l = \log(x^*) - \log(\hat{x}^*) \quad (18)$$



which, after substituting into (17), gives

$$C = 100(e^l - 1) \quad (19)$$

Using the regression model defined in (2), it is not difficult to estimate the standard error of  $l$ , which after applying (19) gives the standard error of the crisis index  $C$  as

$$se(C) = 100e^l se(l) \quad (20)$$

Dividing  $C$  by  $se(C)$  gives the  $t$ -value of the crisis index as

$$t(C) = \frac{x^* - \hat{x}^*}{x^* se(l)} \quad (21)$$

### **III. EMPIRICAL ILLUSTRATION**

#### **A. Economic Impacts of the Crisis**

From 2001 to 2007 before the onset of the crisis, annual growth was robust for Korea (4.49%), Philippines (5.38%), and Thailand (5.53%) (Table 1). Such robust growth occurred despite rising volatility in global financial markets and soaring commodity prices, particularly food and fuel. The main sources for growth are domestic demand and exports to Asian and European markets, with domestic demand playing a major role (ILO, 2009).

GDP growth was similar for both Philippines and Thailand, and both economies performed stronger than Korea. However, the annual growth rate for the Philippines falls to 3.33% and remains behind the other two countries after adjusting for population growth over the period. Before the recent crisis, the driving forces for the Philippines' growth were increased public investment and private consumption.

[Insert Table 1 about here]

Table 1 also presents seasonal effects of economic growth performance for the three economies. It is interesting to note that while the seasonal effects for Korea are statistically insignificant, strong (and statistically significant) seasonality is present in certain quarters for both Philippines and Thailand. The Thai economy contracts by about 5.5% in the second and third quarter of the year relative to the first quarter, but expands by almost 1.3% to 1.4% in the fourth quarter. This suggests that growth slows down during the wet season and gains momentum during the dry season in Thailand. By comparison, GDP growth in the Philippines is higher by more than 3.0% in the second quarter of the year relative to the first quarter, and its growth in the fourth quarter is almost 14.0% higher compared to growth in the first quarter. The main driver for this is accelerated consumer spending related to school opening in the second quarter and holiday seasons in the fourth quarter. Such high consumer spending is in turn financed by remittances that comprise about 11.0% of GDP in the Philippines.

While the three economies have shown robust growth from 2001 to 2007, recent data indicate that they are under significant stress from the global economic crisis. Using the crisis index outlined in Section II, the crisis' impact on GDP is quantified in Table 2 and Figure 1.

[Insert Table 2 about here]

Of the three countries, Thailand is the worst affected by the current crisis in terms of economic impact. The adverse impact of the crisis on economic growth in Thailand has been felt since the second quarter of 2008 and was most severe in the first quarter of 2009. This could also be partly due to the political instability in 2008. The crisis index suggests that the Thailand's per capita real GDP would have been 12.71% higher in the first quarter of 2009 and 11.24% higher in the second quarter of 2009 if the growth trend of 2001–2007 before the crisis had continued. To a lesser extent, per capita real GDP growth in Korea was lower by 6.81% in the fourth quarter of 2008, 7.76% in the first quarter of 2009, and 6.25% in the second quarter of 2009 due to the crisis. Unlike in Korea and Thailand, the crisis' impact on growth in the Philippines was rather

small, although it has become significant since the first quarter of 2009. A similar story emerges for the crisis' impact on total real GDP for the three Asian economies (Figure 1). Compared with economic growth in Korea and Thailand, economic growth in the Philippines has held up relatively well because it is not highly integrated with global financial markets and the broader global economy and remittances from overseas workers did not fall sharply as initially expected.

[Insert Figure 1 about here]

The economies of Korea and Thailand are being adversely affected by the crisis due largely to declining demand for exports and lowered industrial output. Before the crisis, manufacturing exports comprised a significant proportion of GDP, more than 40% in Thailand and more than 30% in Korea. As consumers in developed economies cut back on spending in the wake of the economic downturn, demand for Asia's exports fell sharply. Consumer demand not only for lower value-added goods—such as toys, footwear, and clothing—but also higher value-added products—such as computers and automobiles—fell sharply. Accordingly, industrial output has been curtailed—industrial production fell sharply in the last quarter of 2008, and was down by more than 7% compared to that in the previous year in Thailand (World Bank, 2008).

Like exports, domestic consumption and investment have also played a crucial role in economic growth in Korea and Thailand during the crisis period. While household consumption is about 1.2 times the size of exports in Korea, private consumption in Thailand is only about 80% of exports. In December 2008, consumer confidence in Korea reached its lowest level since the Asian financial crisis in 1997. Along with manufacturing, the construction industry is among the hardest hit by the crisis, particularly in Korea and Thailand.

FDI has been a major driving force for economic growth in many Asian economies including Korea, Philippines, and Thailand, comprising a large share of capital formation in these economies. In 2008, growth in FDI turned negative in some Asian countries including Thailand (UNCTAD 2009). Additionally, decreased tourism is another important way in which the Thai economy has been adversely impacted by the current crisis, although some of this decrease may also have been due to the political crisis in 2008.

What, then, is the economic growth rate that would be required to prevent unemployment from rising? To answer this, we need to calculate the threshold growth rate, i.e., the rate of GDP growth at which there will be no increase in unemployment. If actual GDP growth is higher (lower) than the threshold growth rate, then the unemployment rate will fall (rise). This threshold growth rate depends on the elasticity of employment to GDP growth and the growth rate in labour force participation, which vary across countries. The elasticity of employment to growth measures the extent to which employment is responsive to economic growth. As shown in Figure 2, the estimated elasticities are 0.29 for Korea, 0.36 for Thailand, and 0.44 for Philippines.<sup>2</sup> According to these estimates, every percentage-point of economic growth in the Philippines generates an additional employment of 0.44%, higher than the other two countries. A reason for this is that the Philippine economy, with its large service sector accounting for more than 50% of its total employment in 2009, is relatively more labour intensive than the economies of Korea and Thailand. Although the service sector tends to create more jobs compared to agriculture and industry, the quality of these jobs should be considered, especially considering that service sector jobs encompass all kinds of jobs from taxi drivers and haircutters to lawyers and doctors.

[Insert Figure 2 about here]

As seen in Figure 2, Korea, Thailand, and Philippines experienced GDP growth above the threshold growth rate in 2001–2007; thus, they saw unemployment rates decrease during the period, especially in the Philippines and Thailand (Table 3). However, the global economic crisis in 2008 dramatically changed this trend.

## **B. Labour Market Impacts of the Crisis**

Economic growth is critical for job creation, while demographic dynamics and growth in the working-age population, among other factors, influence labour force growth. The labour force increased at an annual rate of 1.51% in the Philippines and Thailand from 2001 to 2007. Their

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<sup>2</sup> These estimates are obtained by dividing trend growth rates in employment in Table 3 by trend growth rates in GDP in Table 1. For instance, the employment–growth elasticity for the Philippines is obtained by  $2.35/5.38 = 0.44$ .

robust economic growth during 2001 to 2007 could have pulled some previously discouraged workers into labour markets. In Korea, labour force growth was relatively small with just 1.25% growth, reflecting an aging population. While there is no seasonal effect in labour force growth in Korea, seasonal effects are present in other countries, particularly in Thailand and to some extent in the Philippines. In Thailand, labour force growth is especially strong in the third quarter and the fourth quarter relative to the first quarter of the year. On the other hand, the labour force participation in the second quarter is 2.22% higher than that in the first quarter in the Philippines due to the influx of new graduates in April and May.

[Insert Table 3 about here]

The strong economic performance of these three economies during 2001 to 2007 had a positive impact on employment in their labour markets. Employment growth was particularly strong in the Philippines (2.35%) and Thailand (2.01%). While strong employment growth in the Philippines is indeed a positive development, the labour market performance of the country cannot be assessed solely on the basis of the number of jobs created. The quality of jobs, such as working conditions, wages, and benefits, is also important. Job quality, in turn, significantly depends on the growth of labour productivity. It should be noted, however, that better working conditions and higher wages do not necessarily guarantee higher productivity and should be blended with the quality of industrial relations to achieve productivity gains.

Declining unemployment figures in Table 3 also reflect improvement in labour market conditions before the crisis. According to the estimates, the total number of unemployed workers shrank by more than 11% per annum for Thailand and 6% per annum for Philippines during 2001 to 2007. Over the same period, the unemployment rate declined annually by almost 13% for Thailand, 8% for Philippines, and 1.61% for Korea. These jobless rates are found to be statistically significant as shown by the t-values in Table 3. Additionally, the unemployment rates in the third and fourth quarters are significantly lower compared to the first quarter, by as much as 35–39% in Thailand.

[Insert Table 4 about here]

As shown in Table 4, the current crisis has an adverse impact on employment growth in all three Asian economies, but, as expected, its degree differs across countries. In terms of employment, Korea has been hit the hardest of the three; moreover, employment conditions in the country worsened over the crisis period. Without the crisis, employment would have been higher by 2.43%—equivalent to 0.58 million jobs—in the second quarter of 2009, which is far greater than the drop of 0.38%—albeit statistically insignificant—that would have been expected in the first quarter of 2008 (Figure 3). Furthermore, the adverse impact of the crisis on employment is greater for the female labour force than their male counterparts in Korea—a finding that is statistically significant beginning in the fourth quarter of 2008 (Figure 4). This suggests that the crisis reduced jobs among female workers.

[Insert Figure 3 about here]

[Insert Figure 4 about here]

Corollary to this, labour force participation was significantly reduced during the crisis period in Korea (Figure 5). For instance, the crisis index suggests that the labour force participation would have been higher by 2.15% in the first quarter of 2009, and by 1.77% in the second quarter of 2009. Given the decline in employment in Korea, some workers—more likely women than men—have been discouraged to enter the labour market or have become discouraged and left the labour market, or a combination of both.

[Insert Figure 5 about here]

In addition, the study looked at which age groups in Korea are most affected by the crisis in terms of employment. Historical experience suggests that young and old workers are particularly vulnerable to an economic downturn and are more likely to bear the brunt of falling employment. Table 5 shows that employment among workers aged 40–49 years has been significantly declining because of the crisis and its rate of decline has been increasing over the period. Job cuts in the 40–49 age group were initially balanced by job increases among the youth aged from

15 to 19 years. Indeed, employment opportunities for young workers increased significantly by 12.56% in the second quarter of 2008, and by 7.74% in the third quarter of the same year, up from the trend in employment growth before the crisis from 2001 to 2007. A possible explanation for this is that young workers are more likely to be hired for (and are more likely to accept) contractual work, especially if an economic downturn is perceived to be short-lived. However, the increase in employment among young workers below 20 years old did not last long. When the Korean economy began to contract significantly in the fourth quarter of 2008, youth employment shrank by 10.45% from the trend before the crisis. This suggests that when the crisis became severe, young workers were hit most severely by the contraction of labour demand.

[Insert Table 5 about here]

Youth unemployment is becoming an increasingly troublesome issue in Korea. Some causes of such high youth unemployment include (i) prolonged economic downturn that continuously weakens the employment base, (ii) restructuring toward more knowledge-based and technology-intensive industries that enables corporations to do business with fewer workers, and (iii) recent workforce recruitment practices that prefer experienced workers to new labour market entrants to immediately place workers at workplaces. Particularly, with regard to Korean firms' employment practices, Lee and Chung (2003) note that since the 1997 national economic crisis, Korean firms do not tend to view training new employees as a worthwhile investment; instead, they prefer recruiting experienced workers or outsourcing to a qualified workforce. Indeed, while employment of experienced workers has dramatically increased from 2001 to 2009, employment of young workers aged 15 to 39 has been decreasing (Figure 6). All the factors above emphasize "job shortage" as a major problem contributing to the high rate of youth joblessness. To address the issue of youth unemployment, the government established in 2003 the Youth Unemployment Council within the Office for Government Policy Coordination, which operates under the direct control of the prime minister, and launched a vocational competency development training policy. Despite the government's efforts, the trend continues as can be seen in Figure 6.

[Insert Figure 6 about here]

In Thailand, a significant fall in employment due to the crisis occurred only during the second half of 2008 (Table 3), while in the Philippines, employment shrank significantly in the second quarter of 2008. Because of the crisis, employment in the Philippines decreased by 2.83% in the second quarter of 2008 compared to the trend in 2001–2007 (Table 4). The country again experienced a fall in employment in the last quarter of 2008 and the first quarter of 2009. Even though those falls were relatively small compared to that in the second quarter of 2008, they were nevertheless statistically significant. The findings suggest that economies with extensive linkages to the global production chain, such as Korea and Thailand, faced increasing pressures on employment in their labour markets due to the crisis.

[Insert Table 6 about here]

As shown in Table 6, the shifting composition of job growth indicates a move toward more productive employment in the Philippines and Thailand, as reflected in increased labour productivity at an annual rate of 3% in the Philippines, and 3.5% in Thailand before the crisis. During 2001 to 2007 in the Philippines, employment in industry expanded by 1.52%, and in services by 3.31%, whereas job growth in agriculture was only 1.42%. On the other hand, Thailand experienced a growth rate of 3.1% in services, 2.87% in industry, and a sluggish growth of 0.57% in agriculture. For both countries, employment in industry and services grew. This shift in composition of job growth played a major role in lifting the level of productivity in both the Philippines and Thailand as labour productivity is higher in industry and services than in agriculture. However, as of 2009, agriculture still accounts for 48.0% of total employment in Thailand and 45.0% of total employment in the Philippines.

The shifting composition of employment does not reveal the severity of the impact of the crisis on specific sectors. The estimates in Table 7 indicate a significant impact on employment in the industrial sector for both the Philippines and Thailand. The results for the Philippines reveal a significant decrease in industrial jobs during the crisis period. The reduction was particularly sharp in the first half of 2009: employment growth in industry fell by almost 7% in the second quarter of 2009. A recent report suggests that plant and machine operators and assemblers have



lost 250,000 jobs due to the crisis (Yap, 2009). While the results show a significant increase in agricultural jobs only in the second quarter of 2009, there has been, overall, little impact on employment in services and agriculture. The economy's labour productivity declined significantly in the first 6 months of 2009.

[Insert Table 7 about here]

In Thailand, although there is no significant impact on service jobs, the crisis has impacted both agriculture and industry jobs. Employment in agriculture rose significantly in 2009, absorbing some of the job losses in the industrial sector. Industrial jobs have been hit the hardest throughout the crisis period: the fall in employment in industry ranged from 5.1% in the first quarter of 2008 to almost 10.0% in the second quarter of 2009. Female workers in industry have been hit especially hard by the crisis (Table 8). As of the second quarter of 2009, female workers make up 53.5% of total employment in manufacturing. Labour productivity in the Thai economy suffered because of the crisis, particularly after the last quarter of 2008.

[Insert Table 8 about here]

Before the crisis, the number of wage earners increased by 3.28% in the Philippines, whereas the number of own-account workers grew by 1.60% and the number of unpaid family workers grew by 0.87%.<sup>3</sup> As a result, the annual rate of employment growth (2.35%) during 2001 to 2007 was mostly from increased wage employment, indicating a possible expansion in formal employment opportunities for the Philippines' workforce. However, while the significant increase in the number of wage earners, coupled with rapid job growth in services, is a positive development, one should be cautious about the extent to which this trend reflects the expansion of the formal economy. Wage employment does not necessarily mean a job with security of tenure, workers' benefits, and social protection.

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<sup>3</sup> Note that the job growth rate of 0.87% per annum for unpaid family workers was found to be statistically insignificant at 5% significance level. Its estimated t-value was 1.14. On the other hand, the t-value for the growth rate of 3.28% for wage earners was 11.96, and the t-value for the growth rate of 1.60% for own-account workers was 7.52.

A similar trend emerges in Thailand: from 2001 to 2007, the number of government employees grew by 2.75% per annum, and the number of private employees increased by 3.31% per annum. Employment in own-account workers grew by 2.06%, but the number of unpaid family workers actually declined at an annual rate of 0.38% over the period, albeit statistically insignificant. Despite this trend, however, the numbers of own-account and unpaid family workers still remain massive, accounting for more than 12 million jobs for own-account workers and 7.7 million jobs for unpaid family workers as of the second quarter of 2009. On the other hand, 6 in 10 employed women (64%) are unpaid family workers, indicating that women tend to have more limited employment opportunities. In Thailand, the share of own-account workers in total employment is 32% in 2009, and the share of unpaid family workers in total employment is 20.5% for the same year.

[Insert Table 9 about here]

Has the crisis affected workers in the informal sector more adversely than those in the formal sector? Noting that own-account and unpaid family workers are most likely to be in the informal sector, the results in Table 9 suggest that during the crisis period, formal sector jobs such as employers and public and private employees decreased significantly, while the number of informal sector jobs increased, especially in unpaid family work. Workers displaced from the higher-paid formal sector either become discouraged and thus leave the labour market, become unemployed, or move into the informal sector to work as unpaid family workers. Women could be the most likely candidates to become unpaid family workers—as mentioned earlier, in the second quarter of 2009, more than 60% of total unpaid family workers in Thailand were female.

[Insert Figure 7 about here]

Unlike Thailand, there is no significant impact of the crisis on employment by working status in the Philippines. While there has been a shift in employment trends toward unpaid family workers during the crisis (Figure 7), the values of the crisis index are found to be statistically insignificant. However, the number of own-account workers declined significantly since the last quarter of 2008. Since own-account workers include both formal and informal sector jobs, one

cannot draw a robust conclusion that workers are shifting from the formal sector to the informal sector in the Philippines.

Table 10 presents the crisis' impact on the unemployment rate for the three economies. It is interesting to note that while the Philippines and Thailand show an increase in the unemployment rate during the entire crisis period, the unemployment rate began to rise only recently—during the first and second quarter of 2009. More importantly, the current crisis has had little impact on the unemployment rate in the Philippines: the t-value estimates suggest insignificant impacts on the country's unemployment rate. Similarly, the unemployment rate in Korea led to a significant increase due to the crisis only in the second quarter of 2009; without the crisis, the unemployment rate would have been 19.15% lower in April–June 2009 had the 2001–2007 trend continued. Moreover, the crisis' impact on unemployment is significantly higher for male workers than their female counterparts: the crisis led to 18.12% higher unemployment for males and 15.02% higher unemployment for females.

[Insert Table 10 about here]

Unlike Korea and Philippines, the crisis caused significantly higher jobless rates in Thailand than the rates that would have been expected without the crisis. Factors such as declining demand for exports and industrial production, sharp downturns in the construction and tourism sectors, and increasing pressures on domestic demand could have contributed to the increase in Thailand's unemployment rate.

#### **IV. CONCLUSION**

It is no surprise that the global financial crisis had significant impacts on economic output in Asia, especially after one considers the interaction and interdependence of Asia's economies with the rest of the world. What is more interesting is how much insight the crisis has shed on the inner workings of Asia's economies, particularly the three economies in this study. The global crisis is a jarring event that ultimately affects everyone, but its precise impacts depend on the context and underlying vulnerabilities already existing in each country's economy.

The crisis has shown that Korea and Thailand, with their well developed finance, export, and tourism sectors, are highly vulnerable to external shocks—both countries experienced significant reductions in per capita GDP as early as the fourth quarter of 2008. On the other hand, the Philippines’ relative resilience to the crisis—GDP only started to get affected in early 2009 and lightly at that—could also be seen as indicative of a historically underperforming economy. After all, the Philippines’ minimal exposure to global financial markets, weak export growth, and heavy dependence on remittances all contributed to shielding the economy from the immediate impacts of the crisis.

As regards employment, the crisis has highlighted the underlying weaknesses already present in each country’s labour markets. As the crisis impacted firms and industries, those who are most vulnerable were the first to feel its effects.

#### **A. Korea**

In Korea, as the financial crisis brought the Korean Composite Stock Price Index (KOSPI) to record lows, employment started to significantly decrease. As the crisis impacted the more technical and skill-intensive industries—e.g., finance, automotive, and electronics—it was the better educated workers that started to get laid off. However, unwilling to take unskilled jobs, these workers left the labour market; thus, Korea’s labour participation rate was significantly lower by 1.26% from the first quarter of 2008 to the second quarter of 2009 compared to what would have been the participation rate without the crisis.

The crisis also highlighted underlying weaknesses in Korea’s labour market, particularly the vulnerability of female workers and youth unemployment. Beginning in the fourth quarter of 2008 until the second quarter of 2009 (the latest available data), female workers in Korea were significantly more adversely affected by the crisis than males in terms of employment.

More alarming is the trend of youth unemployment in Korea, a pattern that began even before the crisis. Beginning in 2001, firms have been hiring older and more experienced workers while

avoiding young workers to minimize training costs of new workers. When the crisis struck these firms, the workers that were laid off were those who were near retirement (40–49 years old), and the very new workers (15–19 years old). In fact, in the last three quarters of 2008, youth employment was lower by 10.25% (compared with 3.19% lower for the 40–49 age group) due to the crisis compared to what it would have been if it followed its 2001–2007 trend. This is a worrying trend because it could impact the future prospects of Korea’s labour force—masses of highly educated but unemployed and inexperienced young workers can have negative consequences on future growth.

## **B. Philippines**

In the Philippines, the crisis had relatively little impact on economic growth and employment. Even the service sector, which covers the financial and business process outsourcing (BPO) industries, did not experience significant reductions in employment due to the crisis. Although BPO firms in the Philippines often serve US and Euro-zone firms, their relative cost-effectiveness may have shielded them from the immediate impacts of the crisis when client firms started cost-cutting measures. The industrial sector, however, experienced significant reductions in employment due to the crisis beginning in 2008, and more severely in the first half of 2009, when employment in industry was more than 6.5% lower than would have been expected if pre-crisis trends persisted. In general, there has been no observed shift in employment from industry to either service or agriculture, although there was a significant increase of 2.6% in agricultural employment in the second quarter of 2009.

The crisis had no significant impact on the type of employment in the Philippines. Indicatively, the data show a shift toward unpaid family work due to the crisis, but this was statistically insignificant. Although the data may seem reassuring, what is missing is the quality of jobs behind the numbers reported. Of the three sectors reported in labour data, only industrial employment, which significantly fell, can be considered as the fully formal sector. On the other hand, the informal sector permeates the agricultural and service sectors, the latter of which encompasses all kinds of jobs from the formal banking and BPO sector to the informal transportation and household service industries.

### **C. Thailand**

In Thailand, as exports declined due to weak consumer demand abroad, workers in the industrial sector were the first to get laid off as early as the first quarter of 2008. At the same time, employment in agriculture significantly increased, suggesting that laid-off workers returned to the fields. This is supported by data on the crisis' impact on type of employment: beginning in 2008, employment in the formal sector in Thailand (i.e., employers and private employees) decreased significantly, which coincided with a significant increase in the number of unpaid family workers.

Moreover, Thai female workers were particularly hit by the crisis with consistently lower (and statistically significant) employment in industry in 2008 and 2009, while their male counterparts experienced significant reductions in employment only in the first quarters of 2008 and 2009. This could be because female workers in industry are more likely to accept contractual jobs and would thus be the first to be laid off in times of economic trouble.

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## **TABLES AND FIGURES**



Table 1. Growth Rate and Seasonal Effects of GDP and Per Capita GDP, 2001–2007

|  | Philippines                       |         | Thailand |         | Republic of Korea |         |
|--|-----------------------------------|---------|----------|---------|-------------------|---------|
|  | Trend                             | t-value | Trend    | t-value | Trend             | t-value |
|  | Gross Domestic Product            |         |          |         |                   |         |
| Growth rate (p.a.)                         | 5.38*                             | 64.83   | 5.53*    | 63.54   | 4.49*             | 49.21   |
| Seasonal effects (relative to 1st quarter) |                                   |         |          |         |                   |         |
| 2nd quarter                                | 3.20*                             | 6.69    | -5.42*   | -11.80  | -0.11             | -0.21   |
| 3rd quarter                                | 0.68                              | 1.44    | -5.53*   | -12.01  | 0.05              | 0.10    |
| 4th quarter                                | 13.73*                            | 25.83   | 1.34*    | 2.70    | -0.03             | -0.06   |
|  | Per capita Gross Domestic Product |         |          |         |                   |         |
| Growth rate (p.a.)                         | 3.33*                             | 35.58   | 4.79*    | 68.02   | 4.14*             | 46.71   |
| Seasonal effects (relative to 1st quarter) |                                   |         |          |         |                   |         |
| 2nd quarter                                | 3.17*                             | 5.86    | -5.47*   | -14.69  | -0.11             | -0.23   |
| 3rd quarter                                | 0.62                              | 1.17    | -5.46*   | -14.63  | 0.04              | 0.08    |
| 4th quarter                                | 13.64*                            | 22.70   | 1.42*    | 3.52    | -0.05             | -0.10   |

GDP = gross domestic product, p.a. = per annum.

Note: \* Significant at 5%.

Source: Author's calculations.

Table 2. Impact of Crisis on Real Per Capita GDP

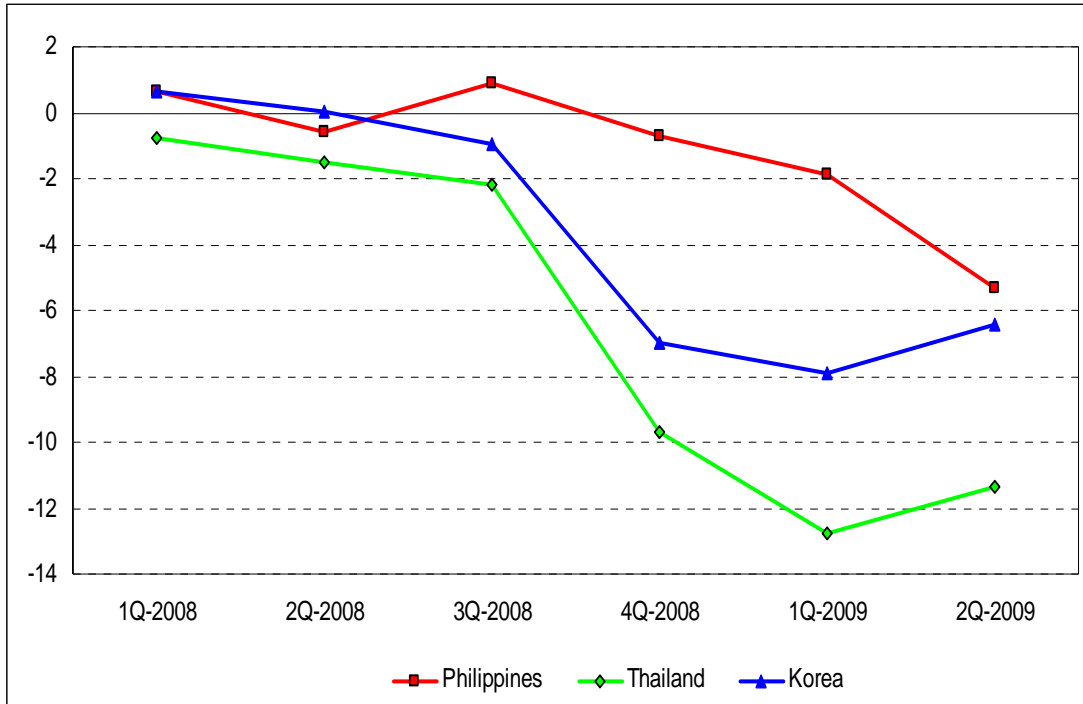
|             | Philippines  |         | Thailand     |         | Republic of Korea |         |
|-------------|--------------|---------|--------------|---------|-------------------|---------|
|             | Crisis index | t-value | Crisis index | t-value | Crisis index      | t-value |
| 2008        |              |         |              |         |                   |         |
| 1st quarter | 0.79         | 1.70    | -0.40        | -1.03   | 0.72              | 1.44    |
| 2nd quarter | -0.49        | -0.94   | -1.13*       | -2.91   | 0.16              | 0.33    |
| 3rd quarter | 1.05*        | 1.97    | -2.29*       | -5.97   | -0.84             | -1.71   |
| 4th quarter | -0.52        | -1.00   | -9.74*       | -27.41  | -6.81*            | -14.73  |
| 2009        |              |         |              |         |                   |         |
| 1st quarter | -1.64*       | -3.17   | -12.71*      | -32.69  | -7.76*            | -14.99  |
| 2nd quarter | -5.16*       | -9.17   | -11.24*      | -28.42  | -6.25*            | -11.86  |

GDP = gross domestic product.

Note: \* Significant at 5%.

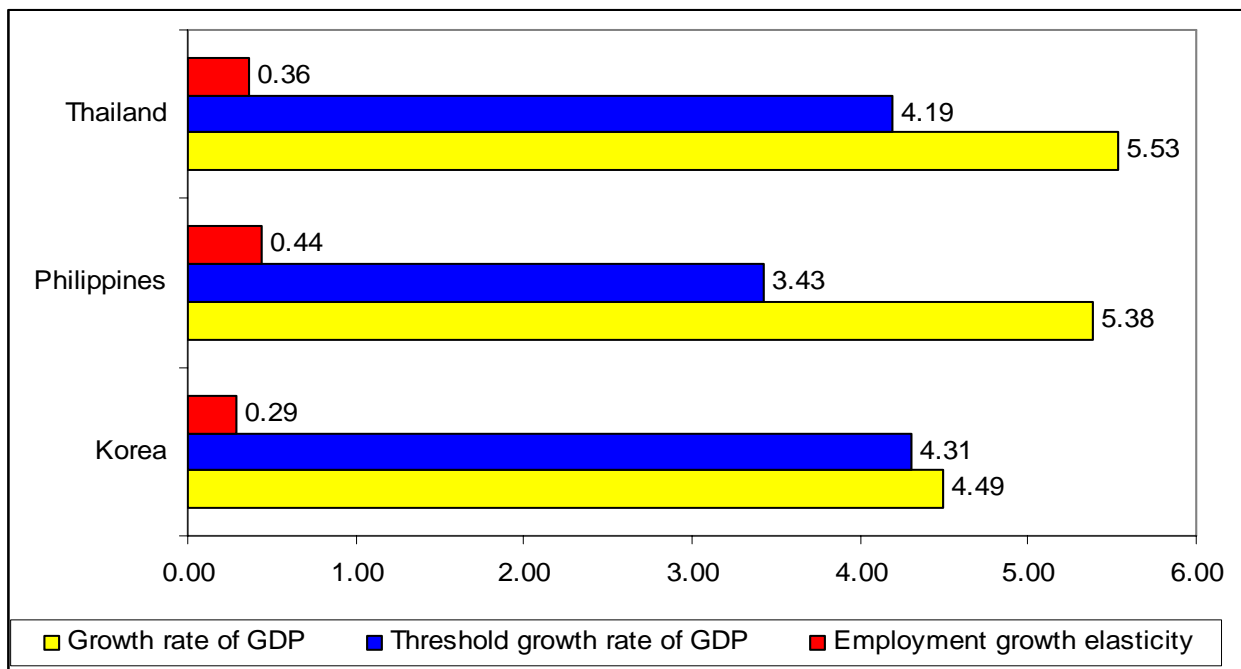
Source: Author's calculations.

Figure 1. Impact of Crisis on Real GDP



GDP = gross domestic product.  
 Note: Y-axis shows values of crisis index.  
 Source: Author's calculations.

Figure 2. Threshold Growth Rate of GDP Required to Prevent an Increase in Unemployment, 2001–2007



GDP = gross domestic product.

Note: The threshold growth rates are defined as growth rates in GDP required to generate enough employment to keep pace with labor force participation growth and hold the unemployment rate constant. This is obtained by dividing growth rates in labor force by employment-growth elasticity. For instance, the threshold growth rate for the Philippines is obtained by dividing the trend growth rate in labor force in Table 3 by the employment-growth elasticity, i.e.,  $3.43 = 1.51/0.44$ .

Source: Author's calculations.

Table 3. Growth Rate of Employment, Unemployment, and Labor Force Participation, 2001–2007

|  | Philippines |         | Thailand |         | Republic of Korea |         |
|--|-------------|---------|----------|---------|-------------------|---------|
|  | Trend       | t-value | Trend    | t-value | Trend             | t-value |
| Employment                                 |             |         |          |         |                   |         |
| Growth rate (p.a.)                         | 2.35*       | 22.55   | 2.01*    | 21.24   | 1.31*             | 21.48   |
| Seasonal effects (relative to 1st quarter) |             |         |          |         |                   |         |
| 2nd quarter                                | 0.92        | 1.55    | 1.60*    | 2.97    | -0.06             | -0.18   |
| 3rd quarter                                | 0.49        | 0.84    | 5.69*    | 10.09   | -0.07             | -0.20   |
| 4th quarter                                | 1.05        | 1.76    | 4.46*    | 7.96    | 0.08              | 0.22    |
| Unemployment                               |             |         |          |         |                   |         |
| Growth rate (p.a.)                         | -6.44*      | -4.49   | -11.29*  | -13.24  | -0.37             | -0.51   |
| Seasonal effects (relative to 1st quarter) |             |         |          |         |                   |         |
| 2nd quarter                                | 11.48       | 1.25    | -9.82*   | -2.19   | -2.44             | -0.60   |
| 3rd quarter                                | 2.37        | 0.28    | -36.41*  | -11.48  | -2.32             | -0.57   |
| 4th quarter                                | -6.69       | -0.86   | -33.18*  | -9.91   | -3.26             | -0.81   |
| Labor force participation                  |             |         |          |         |                   |         |
| Growth rate (p.a.)                         | 1.51*       | 8.33    | 1.51*    | 29.03   | 1.25*             | 27.63   |
| Seasonal effects (relative to 1st quarter) |             |         |          |         |                   |         |
| 2nd quarter                                | 2.22*       | 2.12    | 1.26*    | 4.23    | -0.16             | -0.63   |
| 3rd quarter                                | 0.75        | 0.72    | 3.25*    | 10.66   | -0.16             | -0.64   |
| 4th quarter                                | 0.38        | 0.37    | 2.37*    | 7.80    | -0.05             | -0.20   |
| Unemployment rate                          |             |         |          |         |                   |         |
| Growth rate (p.a.)                         | -7.93*      | -6.24   | -12.94*  | -15.02  | -1.61*            | -2.17   |
| Seasonal effects (relative to 1st quarter) |             |         |          |         |                   |         |
| 2nd quarter                                | 9.17        | 1.14    | -10.90*  | -2.43   | -2.28             | -0.55   |
| 3rd quarter                                | 1.30        | 0.17    | -39.13*  | -12.72  | -2.16             | -0.52   |
| 4th quarter                                | -7.29       | -1.06   | -35.36*  | -10.77  | -3.21             | -0.78   |

p.a. = per annum.

Note: \* Significant at 5%.

Source: Author's calculations.

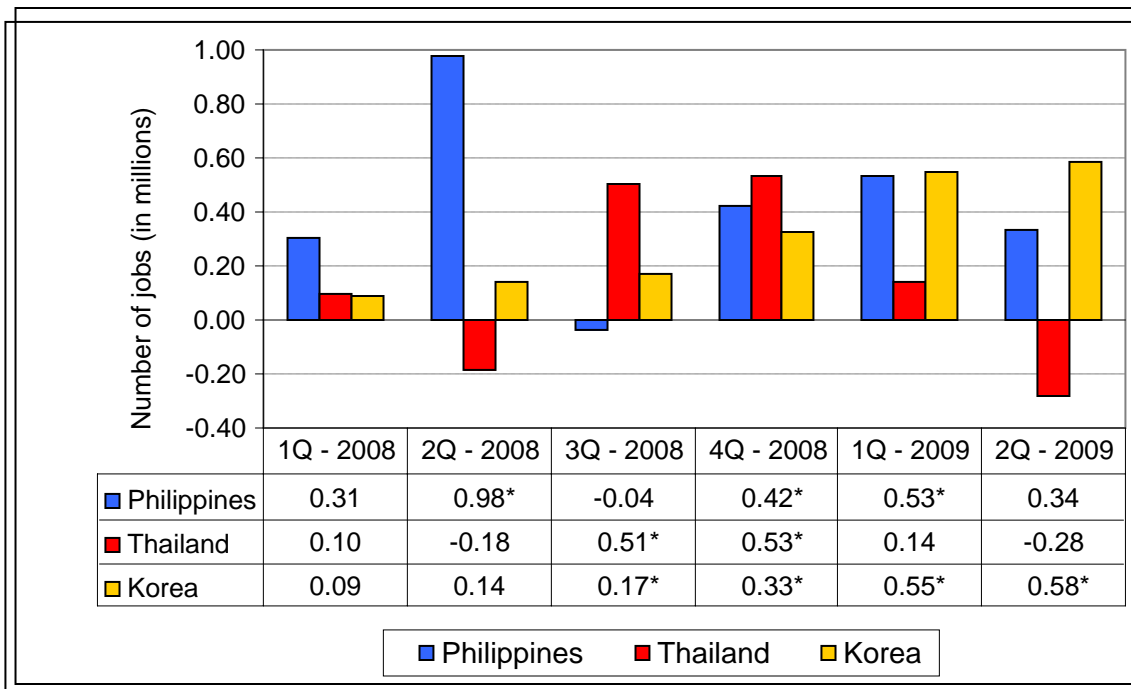
Table 4. Impact of the Crisis on Employment

|             | Philippines  |         | Thailand     |         | Republic of Korea |         |
|-------------|--------------|---------|--------------|---------|-------------------|---------|
|             | Crisis index | t-value | Crisis index | t-value | Crisis index      | t-value |
| 2008        |              |         |              |         |                   |         |
| 1st quarter | -0.90        | -1.55   | -0.27        | -0.51   | -0.38             | -1.11   |
| 2nd quarter | -2.83*       | -4.97   | 0.50         | 0.94    | -0.58             | -1.71   |
| 3rd quarter | 0.11         | 0.18    | -1.32*       | -2.52   | -0.72*            | -2.11   |
| 4th quarter | -1.21*       | -2.09   | -1.40*       | -2.68   | -1.36*            | -4.02   |
| 2009        |              |         |              |         |                   |         |
| 1st quarter | -1.53*       | -2.34   | -0.38        | -0.64   | -2.29*            | -6.01   |
| 2nd quarter | -0.95        | -1.45   | 0.76         | 1.25    | -2.43*            | -6.40   |

Note: \* Significant at 5%.

Source: Author's calculations.

Figure 3. Number of Jobs Lost during the Crisis Period (Millions)



Note: \* Significant at 5%.

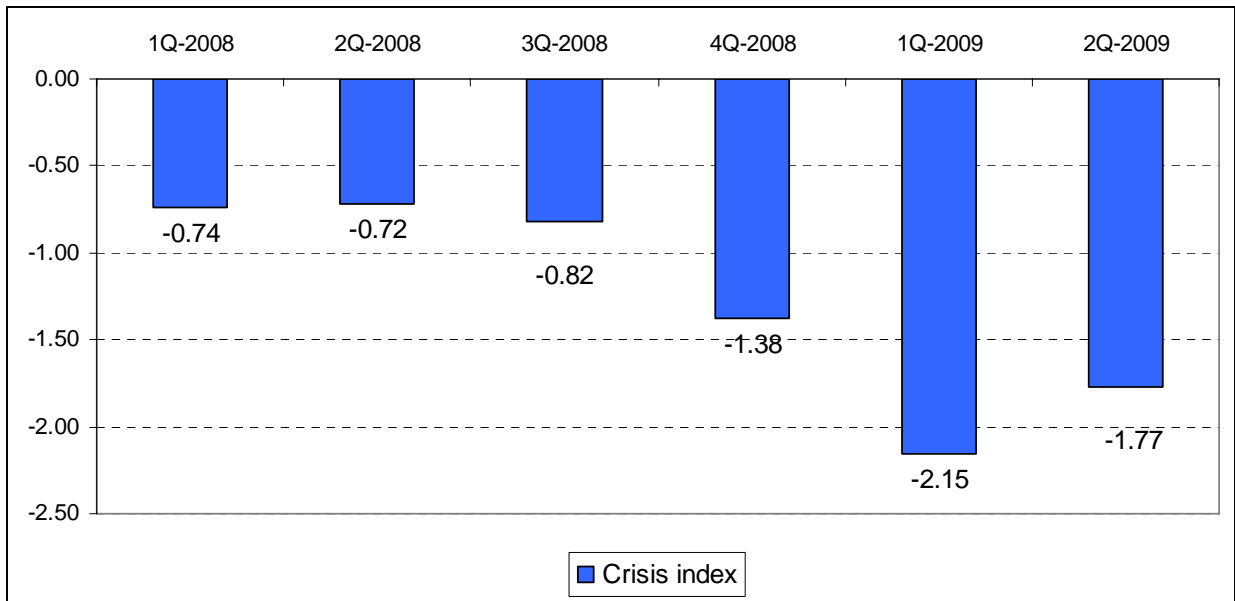
Source: Author's calculations.

Figure 4. Impact of the Crisis on Employment in Republic of Korea by Gender



Source: Author's calculations.

Figure 5. Impact of the Crisis on Labor Force Participation in Republic of Korea



Source: Author's calculations.

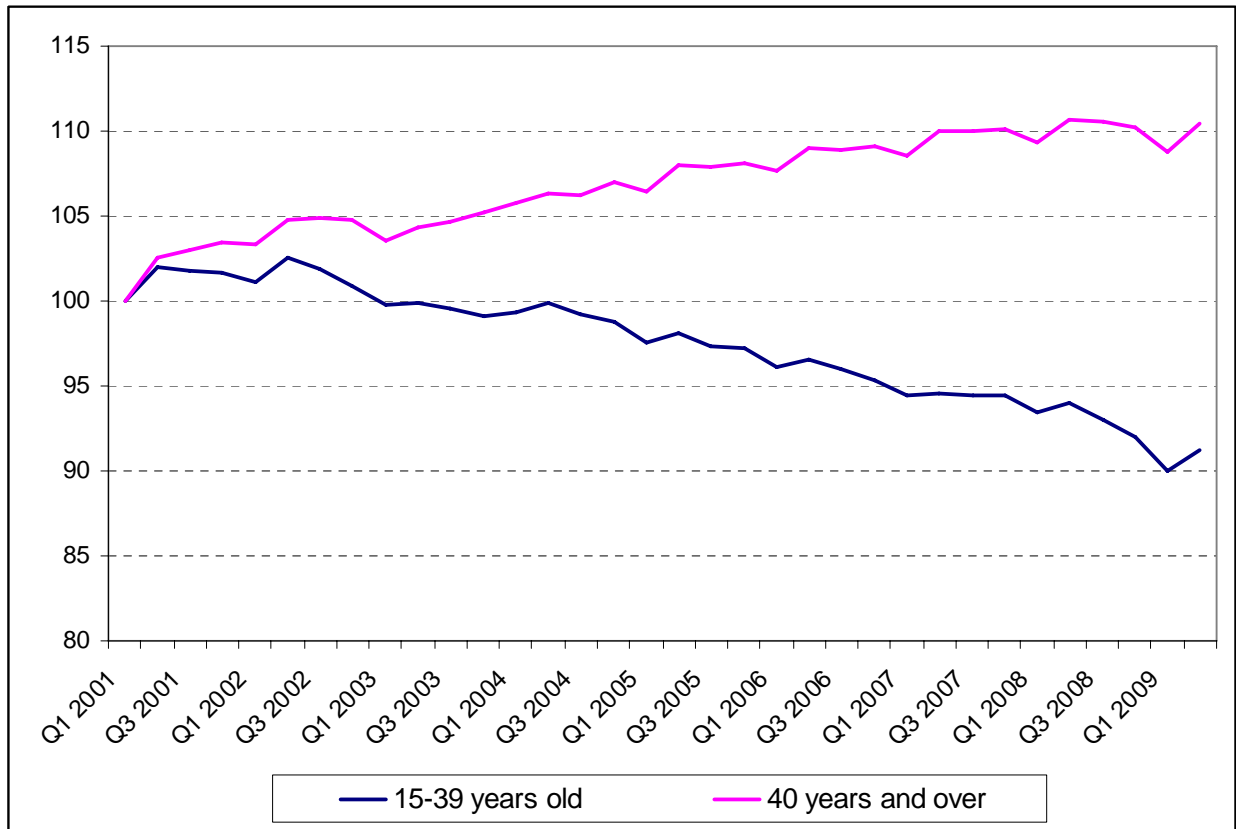
Table 5. Growth and Impact of the Crisis on Employment in Republic of Korea by Age Group

|                                   | 15–19<br>years | 20–29<br>years | 30–39<br>years | 40–49<br>years | 50–59<br>years | 60 years and<br>over |
|-----------------------------------|----------------|----------------|----------------|----------------|----------------|----------------------|
| Annual growth rate<br>(2001–2007) | -8.89*         | -1.99*         | -0.36*         | 2.46*          | 5.49*          | 3.84*                |
| 2008                              |                |                |                |                |                |                      |
| 1st quarter                       | 5.66           | -0.45          | -0.31          | -2.00*         | 2.11*          | -0.12                |
| 2nd quarter                       | 12.56*         | -0.86          | -0.51          | -2.90*         | 0.97           | -2.09                |
| 3rd quarter                       | 7.74*          | -0.97          | -1.17          | -2.98*         | 0.58           | -2.13                |
| 4th quarter                       | -10.45*        | -1.80*         | -1.42          | -3.67*         | 0.71           | -2.71                |
| 2009                              |                |                |                |                |                |                      |
| 1st quarter                       | -2.93          | -3.05*         | -2.61*         | -4.26*         | 1.23           | -2.94                |
| 2nd quarter                       | 5.37           | -0.66          | -3.66*         | -5.64*         | -0.98          | -4.09*               |

Note: \* Significant at 5%.

Source: Author's calculations.

Figure 6. Trend in Employment between Young and Old Workers in Republic of Korea,  
1st Quarter 2001–2nd Quarter 2009 (1st Quarter 2001=100)



Source: Author's calculations.

Table 6. Labour Productivity and Employment Growth by Sector  
in the Philippines and Thailand, 2001–2007

|  | Labour Productivity |         | Agriculture |         | Industry |         | Services |         |
|--|---------------------|---------|-------------|---------|----------|---------|----------|---------|
|  | Trend               | t-value | Trend       | t-value | Trend    | t-value | Trend    | t-value |
| <b>Philippines</b>                         |                     |         |             |         |          |         |          |         |
| Growth rate (p.a.)                         | 3.02*               | 21.38   | 1.42*       | 7.02    | 1.52*    | 7.94    | 3.31*    | 20.95   |
| Seasonal effects (relative to 1st quarter) |                     |         |             |         |          |         |          |         |
| 2nd quarter                                | 2.26                | 2.79    | -0.40       | -0.35   | 4.43*    | 3.92    | 0.70     | 0.79    |
| 3rd quarter                                | 0.18                | 0.23    | 1.03        | 0.89    | 1.60     | 1.45    | -0.22    | -0.25   |
| 4th quarter                                | 12.55*              | 13.96   | 4.07*       | 3.41    | -0.23    | -0.22   | -0.78    | -0.88   |
| <b>Thailand</b>                            |                     |         |             |         |          |         |          |         |
| Growth rate (p.a.)                         | 3.51*               | 33.71   | 0.57*       | 2.18    | 2.87*    | 11.04   | 3.10*    | 14.45   |
| Seasonal effects (relative to 1st quarter) |                     |         |             |         |          |         |          |         |
| 2nd quarter                                | -6.91*              | -12.72  | 7.47*       | 4.68    | -2.50    | -1.76   | -1.41    | -1.19   |
| 3rd quarter                                | -10.62*             | -20.28  | 27.69*      | 14.55   | -11.48*  | -8.85   | -4.14*   | -3.58   |
| 4th quarter                                | -2.98*              | -5.22   | 24.35*      | 13.08   | -12.25*  | -9.49   | -3.64*   | -3.11   |

Note: \* Significant at 5%.

Source: Author's calculations.

Table 7. Impact of the Crisis on Labour Productivity and Employment by Sector

|                    | Labour Productivity |         | Agriculture  |         | Industry     |         | Services     |         |
|--------------------|---------------------|---------|--------------|---------|--------------|---------|--------------|---------|
|                    | Crisis index        | t-value | Crisis index | t-value | Crisis index | t-value | Crisis index | t-value |
| <b>Philippines</b> |                     |         |              |         |              |         |              |         |
| 2008               |                     |         |              |         |              |         |              |         |
| 1st quarter        | 0.30                | 0.38    | -0.42        | -0.37   | -2.68*       | -2.54   | -0.78        | -0.89   |
| 2nd quarter        | 3.82*               | 4.64    | 0.57         | 0.50    | -6.97*       | -6.93   | -3.91*       | -4.58   |
| 3rd quarter        | -0.83               | -1.05   | 0.52         | 0.45    | -2.36*       | -2.23   | 0.46         | 0.52    |
| 4th quarter        | -0.69               | -0.88   | -1.00        | -0.89   | -1.80        | -1.69   | -1.18        | -1.35   |
| 2009               |                     |         |              |         |              |         |              |         |
| 1st quarter        | -3.88*              | -4.50   | -1.28        | -1.00   | -6.47*       | -5.65   | -0.41        | -0.41   |
| 2nd quarter        | -2.05*              | -2.34   | 2.60*        | 1.97    | -6.96*       | -6.11   | -1.61        | -1.63   |
| <b>Thailand</b>    |                     |         |              |         |              |         |              |         |
| 2008               |                     |         |              |         |              |         |              |         |
| 1st quarter        | -0.48               | -0.83   | 3.67*        | 2.39    | -5.10*       | -3.68   | -1.94        | -1.64   |
| 2nd quarter        | -2.03*              | -3.55   | 6.35*        | 4.02    | -6.32*       | -4.62   | -1.53        | -1.29   |
| 3rd quarter        | -0.90               | -1.55   | 1.65         | 1.10    | -7.00*       | -5.16   | -0.96        | -0.80   |
| 4th quarter        | -8.39*              | -15.71  | 2.54         | 1.67    | -7.38*       | -5.46   | -2.12        | -1.80   |
| 2009               |                     |         |              |         |              |         |              |         |
| 1st quarter        | -12.41*             | -21.46  | 3.95*        | 2.26    | -9.25*       | -6.17   | -0.31        | -0.23   |
| 2nd quarter        | -11.99*             | -20.64  | 8.40*        | 4.61    | -9.95*       | -6.70   | -0.76        | -0.56   |

Note: \* Significant at 5%.

Source: Author's calculations.

Table 8. Impact of Crisis on Industrial Employment  
by Gender in Thailand

|             | Male         |         | Female       |         |
|-------------|--------------|---------|--------------|---------|
|             | Crisis index | t-value | Crisis index | t-value |
| 2008        |              |         |              |         |
| 1st quarter | -14.97*      | -2.74   | -3.32*       | -3.19   |
| 2nd quarter | -9.03        | -1.54   | -5.01*       | -4.89   |
| 3rd quarter | -9.81        | -1.69   | -5.54*       | -5.44   |
| 4th quarter | -8.36        | -1.42   | -8.45*       | -8.56   |
| 2009        |              |         |              |         |
| 1st quarter | -18.00*      | -3.02   | -9.25*       | -8.36   |
| 2nd quarter | -11.83       | -1.84   | -10.41*      | -9.52   |

Note: \* Significant at 5%.

Source: Author's calculations.

Table 9. Impact of the Crisis on Employment by Work Status in Thailand

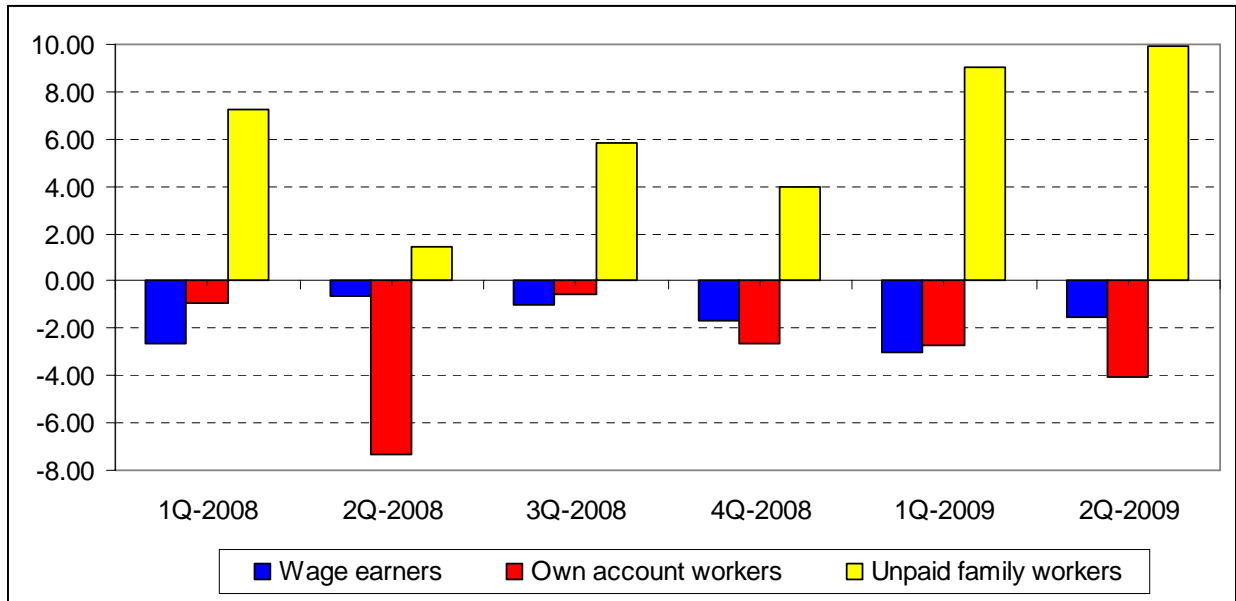
|             | Employers    |         | Government employees |         | Private Employees |         | Own Account Workers |         | Unpaid Family Workers |         |
|-------------|--------------|---------|----------------------|---------|-------------------|---------|---------------------|---------|-----------------------|---------|
|             | Crisis index | t-value | Crisis index         | t-value | Crisis index      | t-value | Crisis index        | t-value | Crisis index          | t-value |
| 2008        |              |         |                      |         |                   |         |                     |         |                       |         |
| 1st quarter | -8.75*       | -3.70   | 0.18                 | 0.08    | -4.36*            | -2.55   | -0.53               | -0.77   | 7.99*                 | 3.38    |
| 2nd quarter | -11.74*      | -5.13   | 3.54                 | 1.51    | -3.58*            | -2.08   | -0.43               | -0.62   | 9.68*                 | 4.04    |
| 3rd quarter | -14.16*      | -6.37   | 4.15                 | 1.77    | -5.54*            | -3.28   | -0.55               | -0.79   | 5.00*                 | 2.18    |
| 4th quarter | -13.04*      | -5.79   | 0.14                 | 0.06    | -7.40*            | -4.48   | 0.56                | 0.80    | 7.74*                 | 3.28    |
| 2009        |              |         |                      |         |                   |         |                     |         |                       |         |
| 1st quarter | -9.55*       | -3.60   | 0.73                 | 0.29    | -7.48*            | -4.00   | 0.54                | 0.68    | 11.96*                | 4.32    |
| 2nd quarter | -7.69*       | -2.84   | 3.57                 | 1.35    | -8.12*            | -4.37   | 1.85*               | 2.31    | 15.68*                | 5.48    |

Note: \* Significant at 5%.

Source: Author's calculations.



Figure 7. Impact of the Crisis on Employment by Work Status in the Philippines



Note: Y-axis shows values of crisis index.

Source: Author's calculations.

Table 10. Impact of the Crisis on Unemployment Rate

|             | Philippines  |         | Thailand     |         | Republic of Korea |         |
|-------------|--------------|---------|--------------|---------|-------------------|---------|
|             | Crisis index | t-value | Crisis index | t-value | Crisis index      | t-value |
| 2008        |              |         |              |         |                   |         |
| 1st quarter | 2.42         | 0.32    | 3.87         | 0.74    | -10.14*           | -2.67   |
| 2nd quarter | 3.48         | 0.46    | 1.72         | 0.34    | -4.48             | -1.11   |
| 3rd quarter | 5.24         | 0.68    | 29.12*       | 4.48    | -3.54             | -0.87   |
| 4th quarter | 7.81         | 0.99    | 42.10*       | 5.88    | -0.95             | -0.23   |
| 2009        |              |         |              |         |                   |         |
| 1st quarter | 15.46        | 1.61    | 48.99*       | 5.77    | 3.92              | 0.79    |
| 2nd quarter | 5.10         | 0.59    | 44.98*       | 5.44    | 19.15*            | 3.36    |

Note: \* Significant at 5%.

Source: Author's calculations.